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Spontaneous carotid artery dissection in pregnancy

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Abstract: We report on a 35-year-old woman who presented at 36 weeks of gestation with headaches and arterial hypertension. She was discharged after ruling out pre-eclampsia. The next day she returned with worsening headaches and an onset of Horner's syndrome. A magnetic resonance (MR) angiography showed extensive dissection of the right-sided internal carotid artery. Anticoagulation and antihypertensive therapies were initiated after delivery of the baby by caesarean. The patient recovered fully. Headache in pregnancy is not always due to pre-eclampsia. Carotid artery dissection (CAD) is a rare but severe cause of headache that typically presents with neck pain and focal neurologic symptoms. Once the diagnosis is established, an immediate treatment should be started in order to minimise damage, especially ischaemic lesions.

Keywords: Carotid artery dissection; headache in pregnancy; Horner's syndrome; hypertension; pregnancy.

Introduction

Spontaneous carotid artery dissection (CAD) is a rare condition with an incidence of about 2/100,000 [1]. Although accounting for not more than 2% of all strokes, dissections of the cervical arteries are an important cause of ischaemic strokes in young and middle-aged patients [2]. Based on research literature, we found several case reports of CAD that occurred in non-pregnant or postpartum patients, but only two cases of spontaneous CAD during pregnancy [3, 4]. This article describes a case of a pregnant woman in the third trimester who was diagnosed with CAD.

Presentation of the case

A 35-year-old patient with 36 weeks of gestation (para 2) with a former caesarean delivery due to pre-eclampsia at 35 weeks of gestation presented in a secondary care hospital with headaches and blood pressure of 140/95 mm Hg. She denied any vomiting, neck pain or visual changes. Her medical history was significant for gestational diabetes, hypothyroidism, and hypertriglyceridaemia.

After ruling out pre-eclampsia she was discharged with symptomatic therapy for non-specific headache. The next day she returned for a follow-up with worsening headaches, a blood pressure of 150/100 mm Hg and an onset of Horner's syndrome with right-sided ptosis and miosis. She was referred to our tertiary care centre for further assessment.

Subsequent examination with magnetic resonance angiography showed extensive dissection of the right-sided internal carotid artery with high-grade stenosis from the carotid bulb to the origin of the posterior communicating artery (Figures 1 and 2). There were no ischaemic cerebral lesions.

Laboratory testing showed slightly elevated liver enzymes and decreasing thrombocytes. As an additional pre-eclampsia could not be ruled out, the decision was made to deliver the baby prior to the beginning of anticoagulation treatment. After an uncomplicated caesarean delivery of a healthy girl, anticoagulation therapy with intravenous heparin was initiated. To keep blood pressure normotensive, an initial regimen of five antihypertensive agents had to be established. Two days after the caesarean, a re-laparotomy was performed due to a progressive haematoma of the abdominal wall. An extended work-up could not identify an underlying cause of the dissection. The following clinical course was unremarkable and the patient was discharged with her baby 12 days after admission

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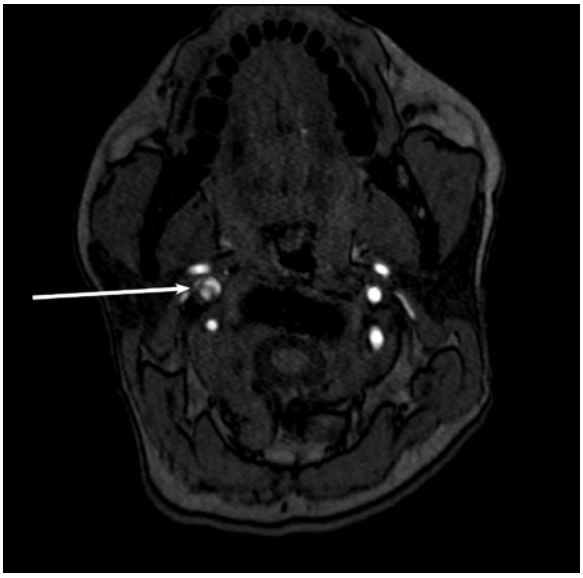

Figure 1: MRI (axial image) showing right internal carotid artery dissection with high grade stenosis.

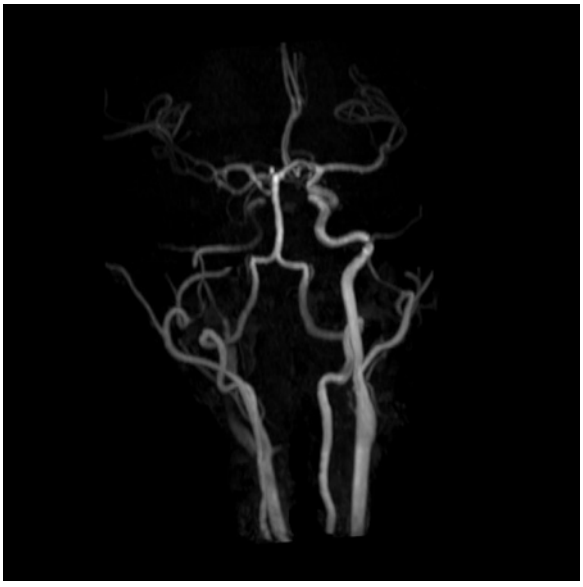

Figure 2: MR angiography (coronal image) showing right internal carotid artery dissection with high-grade stenosis from the carotid bulb to the origin of the posterior communicating artery on the right side.

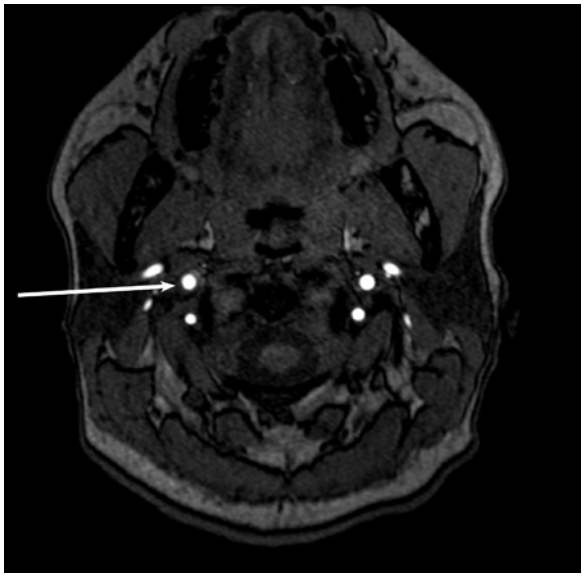

Figure 3: MRI (axial image) showing complete resolution of the stenosis and a small residual intramural haematoma around the area of the dissection.

Figure 4: MR angiography (AP view) showing complete resolution of the stenosis and a small new pseudoaneurysm (0.9×1.4 mm diameter).

with a double antihypertensive regimen. Upon discharge, intravenous anticoagulation therapy was changed to subcutaneous dalteparin. A follow-up magnetic resonance imaging (MRI) 1 month later showed resolution of the internal carotid artery stenosis with only a small residual intramural haematoma around the area of the dissection (Figure 3). A new pseudoaneurysm of 0.9×1.4 mm diameter was seen (Figure 4), which required no treatment. Ischaemic cerebral lesions could again be excluded. Neurologic symptoms were no longer present. The anticoagulation therapy was changed to aspirin 100 mg per day.

Discussion

Headache in pregnancy is mostly due to migraine, tension-type headache or pre-eclampsia. However, clinicians

should also be aware of rare, but serious underlying conditions such as CAD as it is an important and treatable cause of stroke in young and middle-aged patients [2]. CAD typically presents with headache, with or without neck pain (80%), cerebral ischaemia (56%) and Horner's syndrome (25%) [1].

As two thirds of all patients with cervical artery dissection can progress to a transient ischaemic attack or stroke, an immediate treatment should be started once the diagnosis is established [5]. Therefore, the goal of treatment is to prevent an embolisation and to restore blood flow in order to preclude ischaemic lesions and minimise neurological deficits [6]. Medical treatment options are thrombolysis or antithrombotic therapy, either by anticoagulation or antiplatelet therapy. The literature does not favour one of those two options [7]. Should a symptomatic dissection not respond to anticoagulation treatment or in case of contraindications for thrombolysis, further treatment options are endovascular stent placement or surgical interventions [2, 5, 6]. In this case report a heparin regimen was chosen because of its quick adjustability. This was deemed essential in view of the severe stenosis and the performed caesarean section.

When starting an anticoagulation therapy, a treatment for 3–6 months is recommended [5]. This regimen can be changed to aspirin for another 6–9 months in the absence of ischaemic events or (bleeding) disturbances with major haemodynamic compromise [5]. The clinical course described was favourable without any ischaemic events or other complications. Additionally, the follow-up MRI showed complete recanalisation of the vessel and no larger haematoma, which allowed a replacement of dalteparin for aspirin.

The decision to terminate the pregnancy was made for several reasons. Given the urgent need for therapeutic anticoagulation as well as the potential pre-eclampsia, a prompt delivery of the baby was considered to be the safest option for mother and child, especially in view of an almost full-term pregnancy.

A caesarean was favoured over a vaginal delivery as an induction of labour at 36 weeks of gestation would have potentially exceeded an acceptable time frame. The patient's additional history of a caesarean section also limited induction methods. Besides, the possibility of elevated intracranial pressure in the second stage of labour when pushing would have increased the risk of ischaemic lesions.

The aetiology of spontaneous CAD remains unclear [8], re-dissection is very rare [1, 5, 6]. Considering a reported incidence of CAD of about 2/100,000 in the non-pregnant population [1] and only two other case reports of spontaneous CAD in pregnancy [3, 4], there might be an under-reporting in pregnant women.

In summary, CAD is a rare but serious clinical condition in pregnant women. Once the diagnosis is established, an immediate therapy should be started. With this case report, we wish to contribute our experience and emphasise the importance of a thorough examination of pregnant women for CAD, when specific symptoms are present, since the condition must be treated rapidly in order to prevent ischaemic cerebral lesions.

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